Field Analyzer FA735

Users Manual

Also for the FA720, FA725 and FA730

www.envionic.com

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Introduction

This manual is intended for the FA735, and also for the FA720, FA725 and FA730. But these last three devices do not have all features of the FA735.

The features of the four devices can be found in the next table:

	FA720	FA725	FA730	FA735
RF High frequency measurement up to 6 GHz	●	●	●	●
Low frequency electric field measurement			●	●
Low frequency magnetic field measurement			●	●
Data logging on micro-SD memorycard		●		●
Software upgrade through micro-SD card		●		●

For the RF field, not only the strength, but also its frequency can be measured.
The strength of the field is also shown in a graph, as a function of the frequency.

The figures measured are displayed on a clear graphic LCD display.

When measuring high frequency radiation, the pulsation can be heard via the build in speaker. In the ‘time’ mode, you can view these pulses on the screen.

The low frequency fields are also audible on the speaker, and their waveform is visible on the screen.

The data logging function writes the measurement result to a micro-SD memory card every 10 seconds. It writes the current time and date together with these measurements. The recorded data can be viewed on the device itself, or on your PC (as an Excel spreadsheet).

The internal software can be upgraded through the micro-SD card.

The FA735 is a sensitive measurement device that measures three kinds of fields.
The fields measured are:

1) High frequency electromagnetic fields that are emitted by:

- GSM mobile telephones and their base station/ broadcasting masts
- UMTS mobile telephones and their base station/ broadcasting masts
- DECT cordless phone base stations (they emit regardless in use or not)
- DECT cordless telephones
- WLAN (or WIFI) wireless computer networks
- WIMAX wireless network
- wireless video systems
- microwave ovens
- bluetooth wireless systems
- television transmitters

2) Low frequency electric fields (FA 730/735 only) that are emitted by:

- Home supply power lines
- 110 or 230 volt wall sockets and connected appliances (also when switched off)
- Out door electric power lines

3) Low frequency magnetic fields (FA 730/735 only) that are emitted by:

- Power adapters
- Many 110 / 230 volt appliances
- Alarm clocks
- Transformers of halogen incandescent lamps
- outdoor electric power lines
- electric motors/ engines

Accessories

The FA735 is delivered together with:

1. a LogPer directional antenna for the range 1,8 tot 6,0 GHz
2. a non-directional antenna for the range 800 – 1000 MHz
3. a micro-SD memory card of 1 Gigabyte or more
4. a cardreader to connect the micro-SD card to the USB port of your computer
5. two AA Alkaline batteries (or, optional, two NiMH rechargeable batteries)
6. charger for the NiMH rechargeable batteries (option)

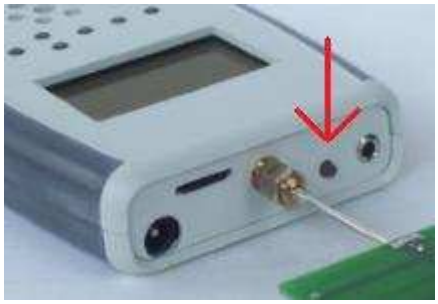
Items 3 and 4 are delivered only with the FA735 and FA725.

The accessories can be from another brand than shown here..

Chapter 1 General

1.1 Switching ON or OFF

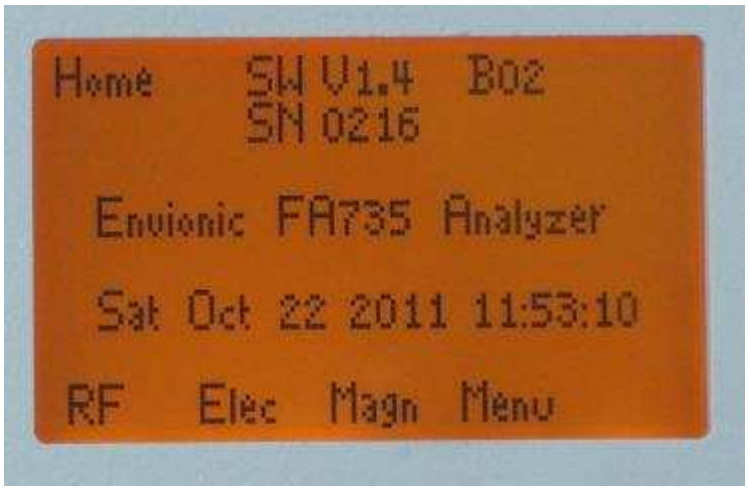
The device is switched on by shortly pressing the little button that is located at the top side. Pressing the same button again switches the device off.



On/Off switch

The function of the frontside buttons will be visible on the bottom of the screen as long as the device is switched on.

On the screen you will see the model number (FA735, FA730, FA725 or FA720), software version (V 1.4) and serial number (0216) of the device.



Screen after power-on (Home)

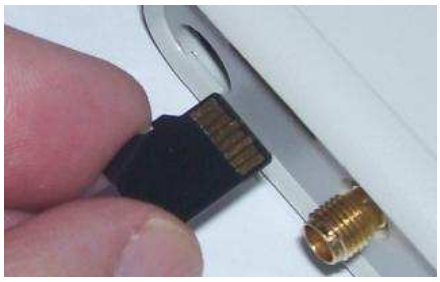
The operating state of the meter is always visible at the left top of the screen. Immediately after switching on, this is 'Home'.

You will also see the current date and time (for FA735 and FA725). When the date or time is not correct, you can set these (see section 1.7).

1.2 Micro-SD memory card

The micro-SD memory card should only be placed or removed when the device is switched off. The card should be placed with its contacts pointing upwards to the top of the device . You can use your nail to push it the last stretch until it clicks.

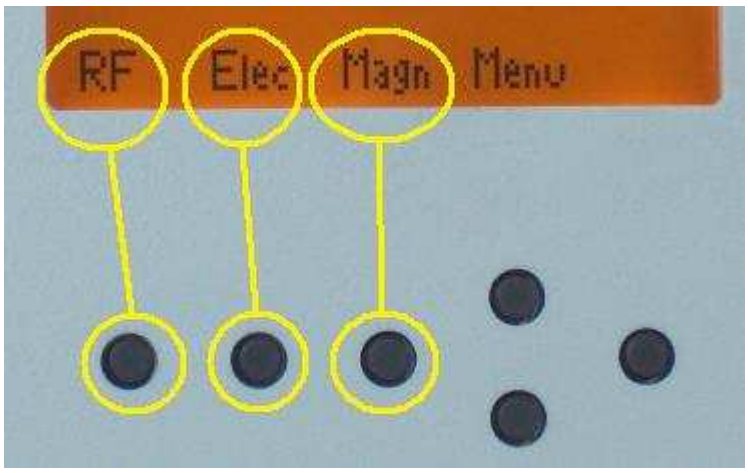
Position of the micro-SD memory card



Contacts of the card pointing upwards

1.3 Choosing what to measure

The function of the frontside buttons will be visible on the bottom of the screen as long as the device is switched on. Directly after switching on, you can choose between:



Push the 1st button ("**RF**") to measure the **high frequency electromagnetic** field (chapter 2).

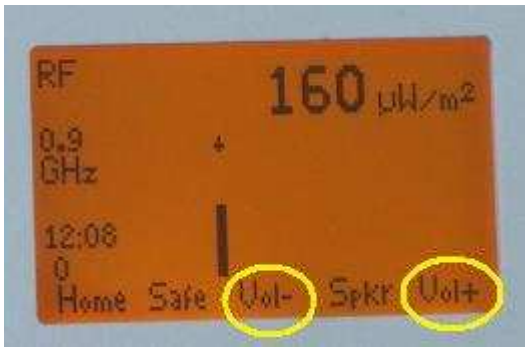
Push the 2nd button ("**Elec**") to measure the low frequency **electric** field (chapter 3).

Push the 3rd button ("**Magn**") to measure the low frequency **magnetic** field (chapter 4).

After measuring, you can go back to this screen with the 1st button ("Home").

1.4 Speaker

After choosing what to measure, you can set the sound to a certain volume with the buttons "Vol+" and "Vol-".



During setting of the volume, the volume setting is displayed. It can be set to a value on a scale from 0 to 8.

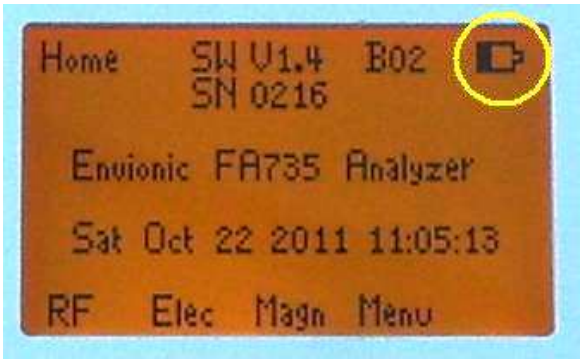
For RF, this gives an audible impression of the pulse modulation of the radiation. After some practice it is possible to identify the kind of radiation by the sound it produces. The strength of the radiation has not much influence on the sound volume. Weak signals can produce almost as much sound as strong signals.

For the low frequency measurements, the sound volume depends on the strength of the signal. To make low frequencies (50 or 60 Hz) audible, some higher harmonics are added to the speaker signal.

Phones connection

One of the two channels of the stereo phones connection provides the sound signal to an external device. The internal speaker will be switched off when this connection is used.

1.5 Batteries



Battery condition

When the batteries are almost empty, this will be shown on the screen:

- At first, as a partly filled battery (see picture)
- After some time, the filling in the battery picture will blink
- When the battery can no longer be used, an empty battery symbol will blink. After that, the device will switch itself off.

Two AA batteries can be found at the backside of the device

Battery compartment

Batteries

1.6 Changing or charging batteries

Mains adapter connection

If rechargeable batteries are used, you can charge them by connecting the delivered wall adapter to the device and to an outlet. After 10 hours, the batteries will be charged completely. The device should be switched off while the batteries are charged.

Caution:

- pay attention to the polarity (+ / -) when you place the batteries
- only use 5 volts adapters (center terminal positive)
- do not charge non-rechargeable batteries
- used batteries should be handled as chemical waste

If you want to check if the batteries are being charged, then switch the device on. You will see an animated picture of a battery that that is being filled. Then you can switch the device off again. If you keep the meter on while the batteries are being charged, this will extend the charging time, because a part of the charging current will be used to power the device.

When you change the batteries, then try to do that within one minute. After one minute, the internal clock may loose the current time and date, and you will have to set these again.

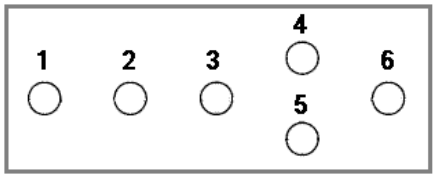
Please be aware that most newly bought NiMH rechargeable batteries have to be charged before the first use.

If you use ordinary (non-rechargeable) batteries, then Alkaline typed are preferred.

The optional power adapter is suitable for mains voltages from at least 100 Volts up to 240 Volts AC.

1.7 Setting time and date

At the home screen, press the ‘Menu’ (button 4) and then the ‘Time’ (button 4 and/or 5). Then activate ‘Time’ with button 6.



Press the ‘OK’ button after setting time and date.

Duing measurements, the time will be shown at the left side of the screen.

Time at the left side of the screen

Chapter 2 High frequency electromagnetic field

When this is selected, "RF" (Radio Frequency) will be visible at the upper left top of the screen.

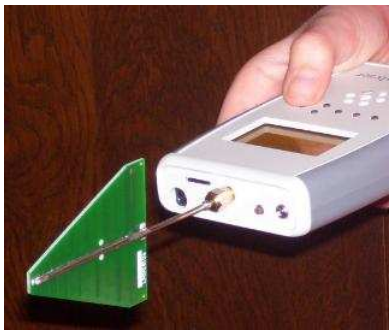
A suitable antenna must be connected. Two antennas are delivered together with the device:

A LogPer directional antenna for the range 1,8 - 6,0 GHz
A non-directional antenna for the range 800 – 1000 MHz

The measured value strongly depends on the position of the device i.e. its distance and angle to the source of radiation, especially for indoor measurements. Radiation is generally not emitted with the same strength in all directions.

In most indoor situation, the radiation is coming directly from the source but can also be reflected by big objects (indoor or outdoor objects). The combination of direct and reflected signals causes interference patterns. Due to interference the measured value can vary a lot, even when the device is moved only about 10 or 20 cm. The interference pattern can also be heard via the speaker.
The highest value measured is used to determine if the amount of radiation is acceptable. The **hold** mode makes it easy to determine the highest value measured when moving the device through the room.

2.1 Measurement with LogPer antenna



Measurement position with LogPer antenna

This antenna is for the range 1,8 - 6,0 GHz.

The LogPer antenna should be pointed in the direction in which you want to measure.
In most cases, the green 'triangle' of the antenna should be vertical, because most signals have vertical polarization. The device itself will mostly be horizontal in these cases.

2.2 Measurement with non-directional antenna

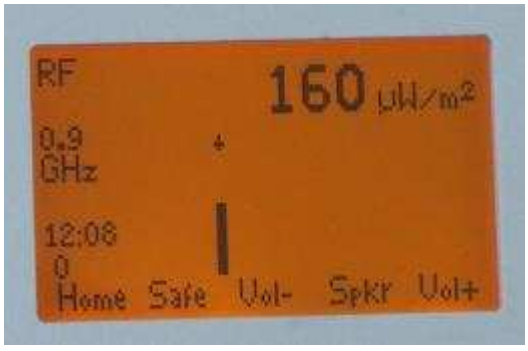
800-1000 MHz antenne

For the non-directional antenna, the device should be held in a vertical position, with the antenna pointing upwards. This will receive signals from all around you. Signals that come from the direction behind your back will be displayed less strong, because these are attenuated while travelling through your body.

Most signals have a “vertical polarization”. Due to this, a vertical position of the device is optimal when using the non-directional antenna. Signals with “horizontal polarization” can be measured by holding the device in a horizontal position.
The polarization of radiation might change when it is reflected from a metal object. Also, the polarization of a signal can be somewhere between horizontal and vertical.

2.3 Display

On the screen you can now directly read the strength of the signal (in microwatt per square meter). When the signal is pulsed, the shown strength is the strength at the top of the pulse.



The frequency of all signals is measured (if possible) and the frequency of the strongest signal is shown at the left side of the screen (here: 0.9GHz). See section 2.4.

2.4 Frequency measurement

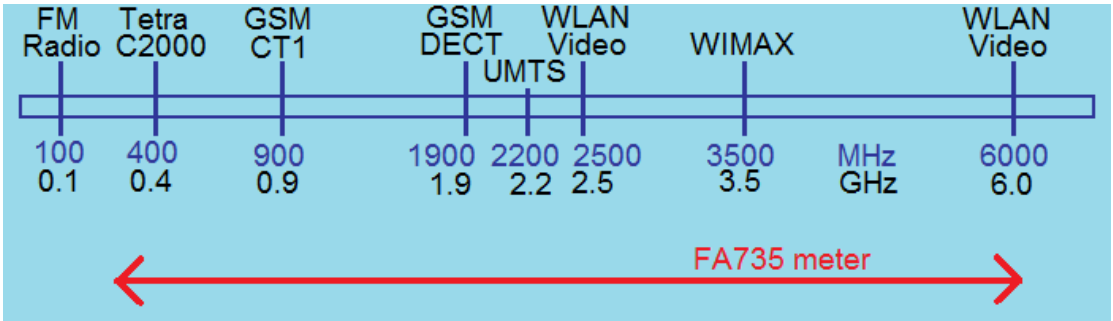
The frequency of all signals is measured, and the frequency is assigned to one of the following categories:

from 0,3 up to 2,8 GHz, 26 categories, ascending per 0,1 GHz
from 3,0 up to 4,0 GHz, in category “3 - 4”
from 4,0 up to 5,0 GHz, in category “4 - 5”
from 5,0 up to 6,0 GHz, in category “5 - 6”
or the category “Any” if the frequency can not be measured.

On the screen you will see a bar chart, that shows the signal strength per category.
The bar display is logarithmic, this means that you can also see small signals while strong pulses of another frequency are present.
Above the signal with the highest strength you will see a small arrow, and the corresponding frequency category is visible at the left side of the screen, with a 'GHz' indication beneath it.

The frequency measurement does not work under all circumstances. The following conditions apply:
The signal has to be strong enough
The signal must not be stronger than the FA735 can measure
The signal must be sufficiently stronger than signals with another frequency that are present at the same moment.

When one of these conditions is not met, then the signal will most likely change from category when you move the device around.

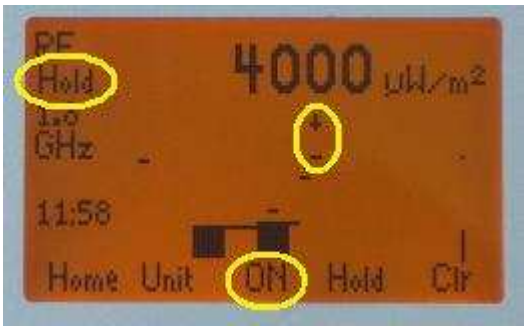


Frequency of several radiation sources

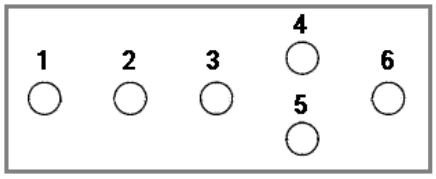
2.5 Hold function

The device will remember the highest measured value for every frequency category. This is visible as a small dash above the bar of the category.

When HOLD is switched on, this highest measured value will be displayed instead of the current value.



This is switched on as follows:
Use button 4 or 5 to switch to the 'Hold' function group. Now you can switch the "Hold" function on or off with button 3. When hold is switched on, you will see "Hold" at the left side of the screen. With button 6 ("Clr") you can reset the hold-values to the current actual value.



2.6 Choosing the measurement unit

Within the "Hold" function group you will als find the "Unit" button (button 2). Here you can change the measurement unit of the device, you can choose between:

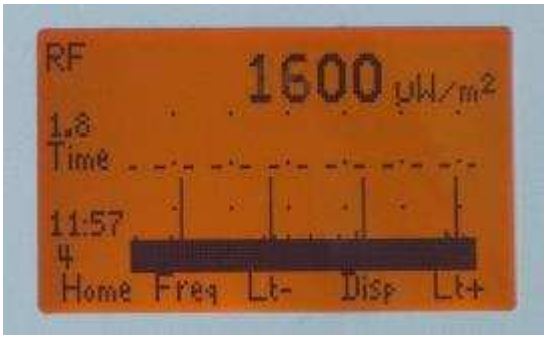
- microwatt per square meter
- millivolt per meter
- dBm (measures the energy level at the antenna connector)

2.7 Display signal pulsation

Instead of a bar diagram that shows the signal strength as a function of the frequency category, you can also show the signal strength as a function of time. If the signal is pulsed, this will show the pulses of the signal.

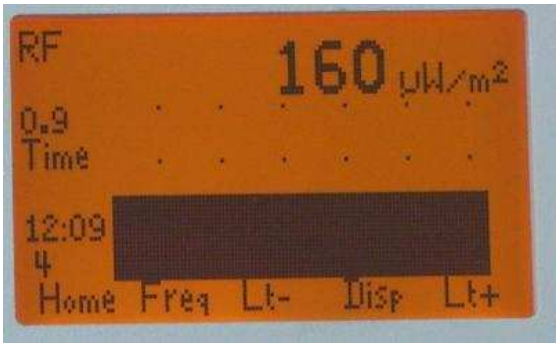
Use button 4 or 5 to select functiongroup "**Disp**". With button 2, you can now set the "Time"display. At the left of the screen, you will now see "Time"instead of "GHz". Pressing button 2 again (it is now called "**Freq**") will switch back to the normal display.

The following example shows the pulses of a DECT base station. (The dotted line is the "Hold"value"). At the left of the screen you will also see the frequency (1.8 GHz). This is not the impulse frequency !

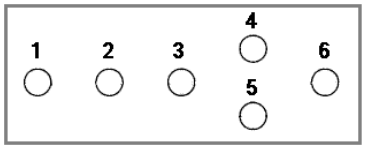


Pulsed DECT signal

A non-pulsed (continuous) signal will be displayed as follows: (example: CT1 cordless telephone):



Non-pulsed signal

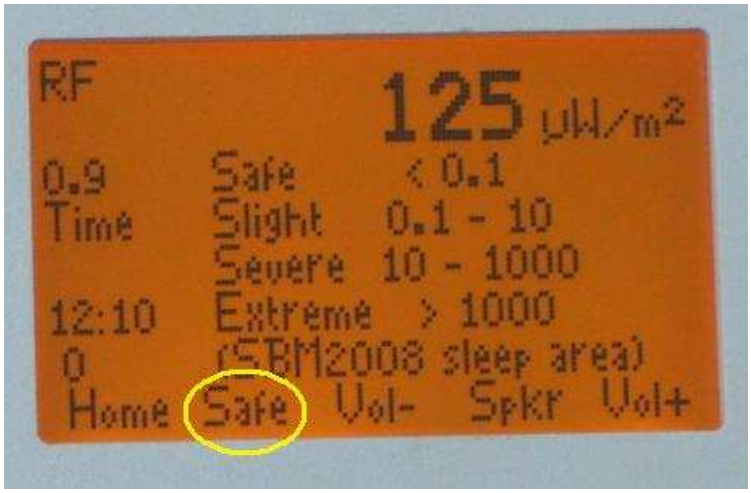


Within this functiongroup "**Disp**", you can use button 3 ("Lt-") en 6 ("Lt+") to change the backlight.
When there is direct sunlight, you get a good visibility by switching the backlight off.

2.8 Safe values

When you choose "Safe", you will see (together with the measured value) what values are safe for the RF electromagnetic field strength during sleep, according to the german SBM2008 standard. Also the values with qualification “slight concern”, “severe concern” and “extreme concern” will be visible.

This only works in the microwatt per square meter setting.
Again pressing “Safe” will switch back to the normal display.



For indoor living or working areas, you can use values that are 10 times higher than the values during sleep, that are shown here.

Chapter 3 Low frequency electric field

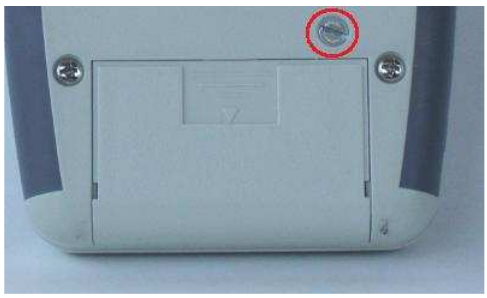
3.1 Orientation

Electric field sensor position

The sensor is at the back side of the device. The device should be held in a vertical position, with the sensor pointing to the direction in which you want to measure.

Do not put your hand in front of the sensor, this will attenuate the electric field and result in a measurement result that is much too low.

The device should be 'grounded' by placing one of your fingers at the grounding point at the backside of the device.



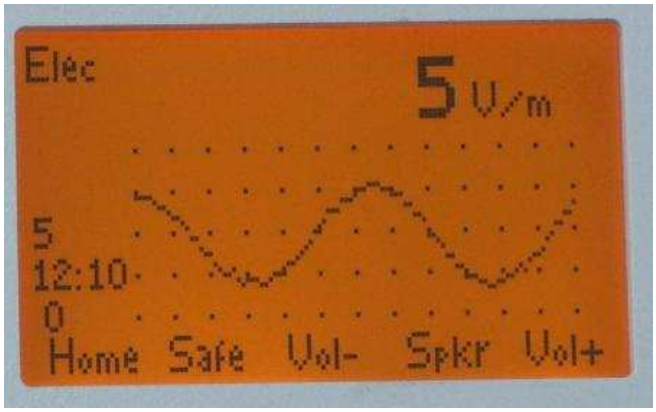
Grounding point

The device responds to changes in the surrounding electric field. This means that it will respond to the 50 Hz changing field of the electric wiring and devices in the house, but it will also respond to a change in the static electric field.
A static electric field can be as strong as 1000V/m and it will not be the same at every place in the room. A small movement in this field can produce a high result on the screen. Thus the device should not be moved during the measuring procedure.
The static electric field can change as well when someone else walks through the room and this also can have an influence on the measurement result.

3.2 Measurements

The display will show the strength of the electric field in V/m (Volts per meter). It will also show the waveform. The vertical height of the waveform is automatically adjusted for optimal visibility.

The range is 0,5 V/m up to 199 V/m.



After switching the device on, it will take 20 seconds before the electric field can be measured.

If you choose “Hold” (switch this on as described in chapter 1), the measurements will stop, and the last measurement will be frozen on the screen, until “Hold”is switched off again.

The distance to the source of the field has a big influence on the measurement result.

3.3 Safe values

When you choose "Safe", you will see (together with the measured value) what values are safe for the electric field strength during sleep, according to the german SBM2008 standard. Also the values with qualification
"slight concern", "severe concern" and "extreme concern" will be visible.

Again pressing "Safe" will switch back to the normal display.

For indoor living or working areas, you can use values that are 10 times higher than the values during sleep, that are shown here.

Chapter 4 Low frequency magnetic field

4.1 Measurement

The magnetic field sensor is placed at the right side of the device. The human body does not shield the magnetic field (as opposed to the electric field), so it is not very important how the device is held in your hand.

The device should be hold in several position, because it is only sensitive to a single direction of the magnetic field lines. The highest measured value should be used.
The device should not be moved during the measurement.

Magnetic sensor position

The display will show the strength of the magneticic field in microTesla. It will also show the waveform. The vertical height of the waveform is automatically adjusted for optimal visibility.

The measurement range is from 0,01 µT up to 3,99 µT.

The distance to the source of the magnetic field has a big influence on the measured strength of the magnetic field.

After switching the device on, it will take 20 seconds before the electric field can be measured.

If you choose “Hold” (switch this on as described in chapter 1), the measurements will stop, and the last measurement will be frozen on the screen, until “Hold”is switched off again.

4.2 Safe values

When you choose "Safe", you will see (together with the measured value) what values are safe for the magnetic field strength during sleep, according to the german SBM2008 standard. Also the values with qualification “slight concern”, “severe concern” and “extreme concern” will be visible.

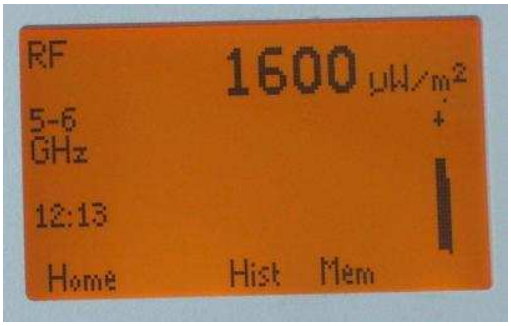
Again pressing “Safe” will switch back to the normal display.

For indoor living or working areas, you can use values that are 10 times higher than the values during sleep, that are shown here.

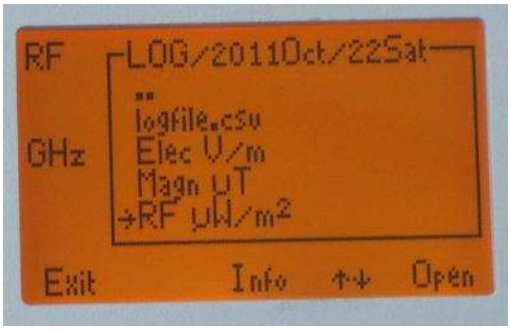
Chapter 5 Displaying logged measurement results

5.1 Display measurements on the FA735

Every 10 seconds, the FA725 and FA735 devices store the measured value on their micro-SD memory card.



You can examine all measurements. Press button 4 or 5 to choose the “Mem” functiongroup. Then push button 3, “Hist””. An overview appears with measurements of the current day.



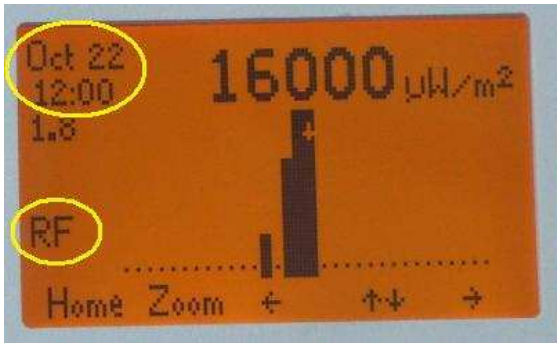
Measurements of one day

In the top line yo see the year, month, date and the day of the week.

Choose the kind of measurements that you want to see (with button 6), for instance “RF uW/m²”.

Use the upper option “..” to get an overview of all measurements of the current month. Again choosing “..” gives an overview measurements of all months.
You can also get an overview of measurements of all months from the “Home” start screen. Just select “Menu” and then “Card”and “Log”.

If the memory card is not present, you will get a warning directly after switching the device on.



Signal strength per quarter of an hour

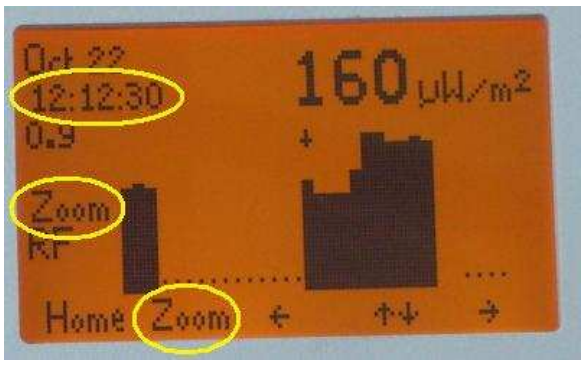
After selecting the measurement, you will see a bar diagram with the maximum strength of every time period. Every bar in the diagram is a period of 15 minutes.

With the arrow buttons (3 and 6) you can move the little arrow on the screen to the left and to the right, selecting a certain time period. The maximal signal strength of the selected period will be shown at the top of the screen. In the next example (signal strength per 10 sec) this little arrow is under the "1" of the value "160".

The starting time of the choosen time period is shown at the top left corner of the screen (in the example: october 22, 12:00). The frequency category that belongs to the choosen time period, is at the left side of the screen.

There are 32 time periods on screen, together this is 8 hours. The other hours of the day become visible by moving the arrow to the side of the screen.

The arrow buttons have an auto-repeat function. The button function will repeat if the button is pressed for longer than half a second.



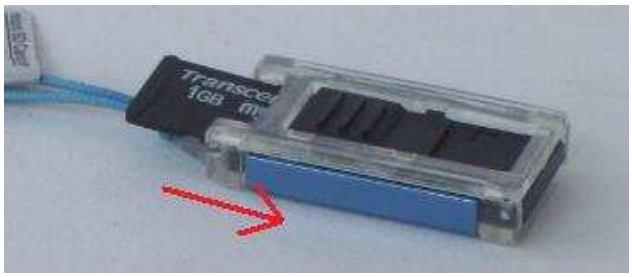
Signal strength per 10 sec (zoom)

If you want a more detailed overview, you can press button 2 ("Zoom"). This will enlarge the choosen 15 minutes to 90 bars of 10 seconds each. The Zoom state will be indicated at the left side of the screen.

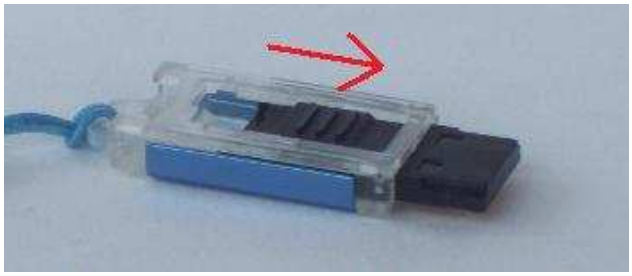
Pressing "Zoom"again will bring you back to the bars of 15 minutes.

5.2 Connecting the Micro-SD card to your PC

You can also see the stored measurements as a spreadsheet on your PC with Microsoft Excel. Switch the device off, and remove the micro-Sd card. Use your nail to press the micro-SD card a little, the card will then be released and you can take it out.



Put the micro SD card in the cardreader



Push the slide of the cardreader

Use the cardreader (that is included with the FA725/735) to connect the micro-SD card to a USB port of your computer. The cardreader should be placed with the blue side facing upwards. (It will fit in two ways, but it will work in only one way).

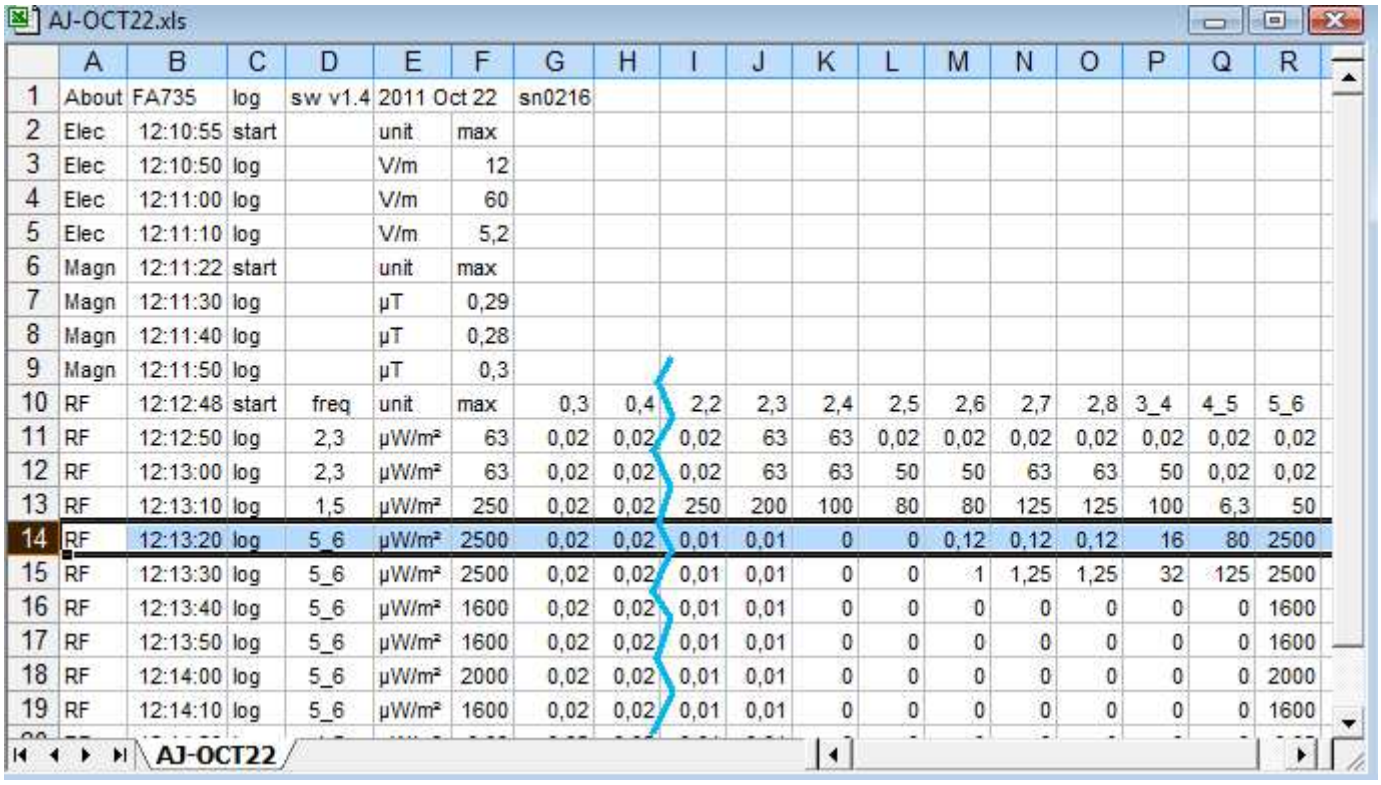
As soon as the cardreader is attached to the PC, a window will pop up.
Choose "Open folder to view files". Then choose the folder "Log", and then select the month and day of the measurements that you want to see.

In this folder you see a file xx-yyyzz.csv,
(xx = A..Z, yyy = month, zz=day), for example AJ-OCT22.CSV

When you click on this file, Microsoft Excel will open and show the measurements (see next section).

If you want, you can copy this file to your PC to archive it. You can put the files of all days in the same folder, the xx code in the name guarantees that the files will be sorted according to their date. The first 'x' is the year (A=2011) and the second 'x' is the month (A=january).

5.3 View measurements with your computer



AJ-OCT22.xls

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R
1	About	FA735	log	sw v1.4	2011 Oct 22		sn0216											
2	Elec	12:10:55	start		unit	max												
3	Elec	12:10:50	log		V/m	12												
4	Elec	12:11:00	log		V/m	60												
5	Elec	12:11:10	log		V/m	5,2												
6	Magn	12:11:22	start		unit	max												
7	Magn	12:11:30	log		µT	0,29												
8	Magn	12:11:40	log		µT	0,28												
9	Magn	12:11:50	log		µT	0,3												
10	RF	12:12:48	start	freq	unit	max	0,3	0,4	2,2	2,3	2,4	2,5	2,6	2,7	2,8	3_4	4_5	5_6
11	RF	12:12:50	log	2,3	µW/m²	63	0,02	0,02	0,02	63	63	0,02	0,02	0,02	0,02	0,02	0,02	0,02
12	RF	12:13:00	log	2,3	µW/m²	63	0,02	0,02	0,02	63	63	50	50	63	63	50	0,02	0,02
13	RF	12:13:10	log	1,5	µW/m²	250	0,02	0,02	250	200	100	80	80	125	125	100	6,3	50
14	RF	12:13:20	log	5_6	µW/m²	2500	0,02	0,02	0,01	0,01	0	0	0,12	0,12	0,12	16	80	2500
15	RF	12:13:30	log	5_6	µW/m²	2500	0,02	0,02	0,01	0,01	0	0	1	1,25	1,25	32	125	2500
16	RF	12:13:40	log	5_6	µW/m²	1600	0,02	0,02	0,01	0,01	0	0	0	0	0	0	0	1600
17	RF	12:13:50	log	5_6	µW/m²	1600	0,02	0,02	0,01	0,01	0	0	0	0	0	0	0	1600
18	RF	12:14:00	log	5_6	µW/m²	2000	0,02	0,02	0,01	0,01	0	0	0	0	0	0	0	2000
19	RF	12:14:10	log	5_6	µW/m²	1600	0,02	0,02	0,01	0,01	0	0	0	0	0	0	0	1600

AJ-OCT22

At row 1 you see the software version, the date, and the serialnumber of the device.

Row 2 indicates the moment when the electrical field measurement is started. The values for electric field measurement are in row 3 up to 5. De unit is in column E, and the value itself is in column F.

Row 6 indicates the start of the magnetic field measurement. The values for magnetic field measurement are in row 7 up to 9. De unit is in column E, and the value itself is in column F.

Row 10 ('RF') indicates the start of the electromagnetic field measurement, and indicates the meaning of the cells in the following RF rows. Cell G10 up to R10 indicate the frequency category of the cells below them. (In this example, several columns are deleted between comlumn H and I, to get a clearer picture). The first frequency category is “0,3 GHz” (300MHz) and the last one is “5 tot 6 GHz”. Frequencies of 2.9 GHz go into the 3-4 GHz range.

We will take row 14 as an example for the RF values. In this row, columns G, H, I etc. indicate the values that belong to the frequency in the same column in row 10.
The frequency category with the highest value is in column D, this is 5-6 GHz. The value that belongs to this frequency is in column F (in column “max”), this value is 2500 microwatt/m2 here. The same value is found in column R, that contains the values for 5-6 GHz.

The unit for RF measurement (column E) is the same as the unit used during the measurements.

Appendices

Appendix 1 Specifications FA735

High frequency:

- Measurement high frequency:
  300 Megahertz up to 6,0 Gigahertz
  Display in microWatt per square meter (µW/m²) , Volt per meter (V/m) or dBm.
  Range approx. 0,4 µW/m² up to 40000 µW/m²
- Measurement of frequency, 300 MHz up to 6 GHz
- Display shows signal strength as a function of frequency or time
- Logaritmic scale can show weak signals in the presence of strong pulses of another frequency
- Displays the peak value of pulsed signals
- Hold function for remembering the highest peak value
- SMA connector for external antenna
- Antennas for 800 - 1000 MHz and for 1.8 - 6 GHz are included

Low frequency:

- Low frequency electric field from 0,5 V/m up to 199 V/m (Volt per meter). Internal sensor
- Low frequency magnetic field from 0,01 µT up to 3,99 µT (microTesla). Internal sensor

- Shows the waveform of low frequency elektric and magnetic fields

General:

- Automatic logging of measurement values on a micro-SD memory card
- Measurements are stored together with time and date
- Shows stored measurements on the display or as a spreadsheet on a PC (with Excel)
- Graphic display, 128x64 pixels, ith adjustable backlight
- Speaker with volume control, to make the signals audible
- Connection for external speaker
- Internal software upgradeable through the micro-SD memory card

- Powered by 2 AA batteries (included) or rechargeable batteries (option).
- Indication for battery condition
- Connection for battery charger
- Builtin charger for NiMH rechargeable batteries
- Dimensions 150 x 90 x 24 mm (excl antenna).
- weight 240 gram

Appendix 2 Conversion from microwatt /m² to milliVolt /meter.

The screen displays the strength of the radiation in microwatt per square meter (µW/m²).. The unit 'Volt per meter' (V/m) is also frequently used, and can be calculated with the following table.

	display
mV/m	µW/m²
4000	40.000
3500	32.000
3200	25.000
2800	20.000
2500	16.000
2200	12.500
2000	**10.000**
1800	8.000
1600	6.300
1400	5.000
1250	4.000
1100	3.200
1000	2.500
900	2.000
800	1.600
700	1.250
620	**1.000**
560	800
500	630
450	500
400	400
350	320
320	250
280	200
250	160
220	125
200	**100**
180	80
160	63
140	50
125	40
110	32
100	25
90	20
80	16
70	12,5
62	**10,0**
56	8,0
50	6,3
45	5,0
40	4,0
35	3,2
32	2,5
28	2,0
25	1,6
22	1,25
20	**1,00**
18	0,80
16	0,63
14	0,50
12,5	0,40
11	0,32
10	0,25
9	0,20
8	0,16
7	0,125
6,2	**0,100**
5,6	0,080
5,0	0,063
4,5	0,050
4,0	0,040
3,5	0,032
3,2	0,025
2,8	0,020
2,5	0,016
2,2	0,0125
2,0	**0,0100**

The value in the mV/m column should be divided by 1000 to convert it to Volt per meter.

The conversion between these units is quadratic. When the mV/m value doubles, the µW/m² value quadruples.

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Appendix 3 More information

www.powerwatch.org.uk
www.scram.uk.com
www.mast-victims.org
www.buergerwelle.de/english_start.html
www.tetrawatch.net

The SBM2008 can be found at:
http://www.baubiologie.de

Appendix 4 Abbreviations

Hz	Hertz	Unit for the number of cycles per second
KHz	KiloHertz	1.000 Hertz
MHz	MegaHertz	1.000.000 Hertz
GHz	GigaHertz	1.000.000.000 Hertz
T	Tesla	Unit for strength of magnetic field
µT	microTesla	0,000.001 Tesla
nT	nanoTesla	0,000.000.001 Tesla
V	Volt	Unit for electric potential difference
mV	milliVolt	0,001 Volt
W	Watt	Unit for power (energy per second)
µW	microWatt	0,000.001 Watt

DECT	Digital Enhanced Cordless Telephone
GSM	Global System for Mobile Communications
TETRA	Terrestrial Trunked Radio
UMTS	Universal Mobile telecommunications system
WLAN	Wireless local area network

Due to continuous improvements in the described devices, information contained in this manual is subject to change without notice.

The device and the manual were assembled with great care. However, the seller or manufacturer can not be held responsible if any direct or indirect damage occurs during or after the use of this device or the information in this manual.